Dart Aerospace Ltd. Tuesday, 22/05/2007 10:12:35 AM Linda Lacelle User: **Process Sheet** : X-TUBE 412 **Drawing Name** Customer : CU-DAR001 Dart Helicopters Services Job Number : 32447 **Estimate Number** : 12727 : NIA : D412664245 **Part Number** P.O. Number D412-664-245 REV C S.O. No. : 1/1/A : 22/05/2007 **Drawing Number** This Issue : N/A **Project Number** Prsht Rev. : LANDING GEAR : C **Drawing Revision** First Issue Type : 32446 Alh: Material Previous Run : 15/06/2007 Qty: **Due Date** 1 Um: Written By Checked & Approved By New Issue 07-02-14 JLM Comment **Additional Product** Job Number: **Description:** Seq. #: Machine Or Operation: DOCUMENT CONTROL 1.0 DC Comment: DOCUMENT CONTROL \$ \$ 57/05/23 Photocopy bluefile & type labels per PPPD412-664-205 CHG001 D6009129 Crosstube Material 2.0 1.0000 Each(s)/Unit Total: 1.0000 Each(s) Comment: Qty.: Pick: Qty Part number Description Batch 1 D6009-129 Crosstube 26548 Check OD = 3.500"; ID = 2.250" MORI SEIKI CNC LATHE LARGE MORI SEIKI 3.0 Comment: 1-TURN AS PER FOLIO FA690 & DWG D412-664-245, FOLIO REV: DWG REV: C 2-DEBURR AS REQUIRED INSPECT PARTS AS THEY COME OFF MACHINE 4.0 QC2

Each

QC8

Comment: INSPECT PARTS AS THEY COME OFF MACHINE

SECOND CHECK







5.0

W/O:		WORK ORDER CHANGES								
DATE	STEP	PROCEDURE CHANGE	Ву	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector			
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Part No:	PAR #:	Fault Category:	NCR: Yes No	DQA:	Date:
			QA: N/C C	losed:	Date:

NCR:			WORK ORDER NON-CONFORMANCE (NCR)									
		Description of NC		Corrective Action Section B		Verification	Approval	Annroyal				
DATE	STEP	Section A	Initial Chief Eng	Action Description Chief Eng	Sign & Date	Section C	Chief Eng	Approval QC Inspector				
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Tüesday, ,22/05/2007 10:12:35 AM Date: User: Linda Lacelle **Process Sheet** Customer: CU-DAR001 Dart Helicopters Services Drawing Name: X-TUBE 412 Part Number: D412664245 Job Number: 32447 Job Number: Description: Seq. #: **Machine Or Operation:** LANDING GEAR 1 LANDING GEAR RESOURCE 1 Comment: | ANDING GEAR RESOURCE 1 Jb7-5-28 1-Polish entire outside surface of crosstube INSPECT WORK TO CURRENT STEP 7.0 QC5 Comment: JNSPECT WORK TO CURRENT STEP HAND FINISHING RESOURCE #1 HAND FINISHING1 Comment: HAND FINISHING RESOURCE #1 Chemical Conversion Coat as per QSI 005 4.1 INSPECT POWDER COAT/CHEMICAL CONVERSION Comment: INSPECT POWDER COAT/CHEMICAL CONVERSION INSPECT WORK TO CURRENT STEF 10.0 QC5 WORK TO CURRENT STEP Comment: INSPEC BENDING BENDING MACHINE 11.0 Comment: BENDING MACHINE Bend tube as per Dwg D412-664-243 using CNC bender program 412-af and Folio FT010 DIMENSIONAL CHECK OF X-TUBES 12.0

Comment: DIMENSIONAL CHECK OF X-TUBES

LANDING GEAR RESOURCE 1

LANDING GEAR 1



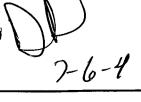


Comment: LANDING GEAR RESOURCE 1

1-Mark cut lines as per dwg D412-664-245

2-Cut tube as per dwg D412-664-245

3-Deburr and engrave part#/batch# per dwg



7-6-4 1307-6-5

13:0

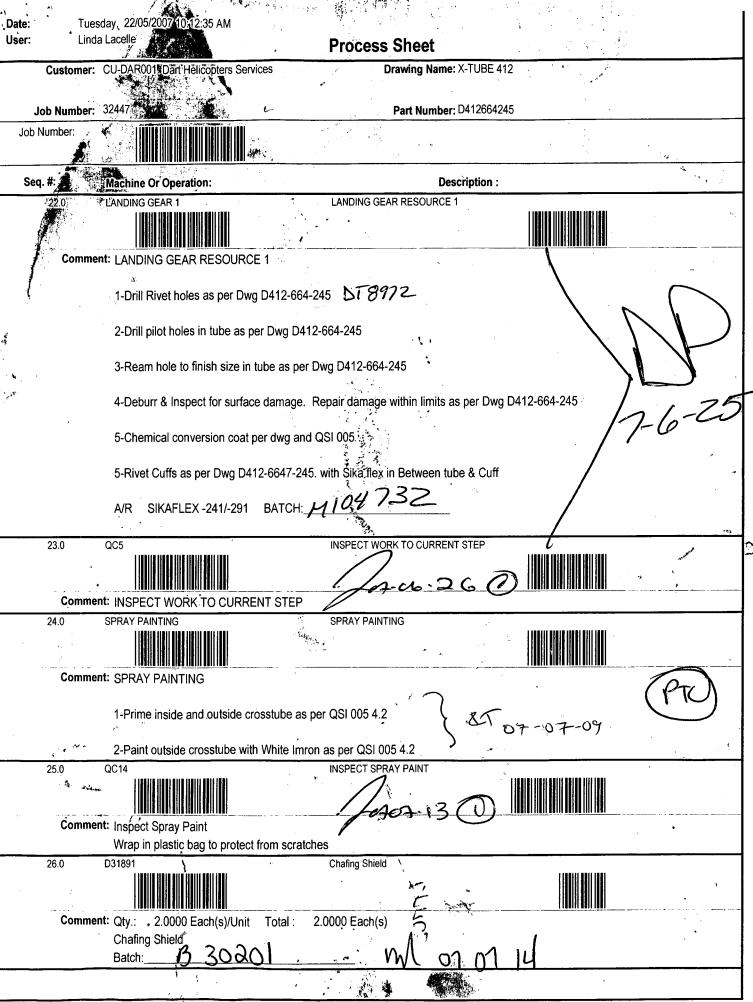
Dart Ae	rospace L	td								
W/O:			W	ORK ORDER CHAN	GES					
DATE	STEP	PRO	OCEDURE CHA	NGE		Ву	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector
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Part No	:	PAR #:	Fault Cate	gory:	NCF	R: Yes	No DQ	A:	Date:	
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NCR:			WORK ORD	ER NON-CONFORM	IANCE	(NCR)			
		Description of NC		Corrective Action Se	ction B		Verific	ation	Approval	Approval
DATE	STEP	Section A	Initial Chief Eng	Action Description Chief Eng		Sign & Date	Secti		Chief Eng	QC Inspector
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User: **Process Sheet** Drawing Name: X-TUBE 412 Part Number: D412664245 1.25 **Description:** Machine Or Operation 14.0 HAND FINISHING1 HAND FINISHING RESOURCE #1 Comment: HAND FINISHING RESOURCE #1 Chemical Conversion Coat Tube & Cuffs as per QSI 005 4.1 INSPECT POWDER COAT/CHEMICAL CONVERSION Comment: INSPECT POWDER COAT/CHEMICAL CONVERSION INSPECT WORK TO CURRENT STEP Comment: INSPECT WORK TO CURRENT STEP OUTSIDE SERVICES -LG OUTSIDE SERV.10 17.0 Comment: Sub-Contracting OUTSIDE SERVICES Liquid Penetrant Inspection as per QSI 038Or (207106106 W Issue P/O: 3909 LPI as per ASTM 1417 Level 2 Attach copy of NDT results to work order PACKAGING ' PACKAGING RESOURCE #1 18.0 Comment: PACKAGING RESOURCE #1 Inspect for transit damage Ensure copy of NDT results attached to work order. 19.0 QC5 Comment: Inspect for damage & ensure results are as per Dwg D412-664-203 D36061 20.0 Comment: Qty.: 2.0000 Each(s)/Unit Total: 2.0000 Each(s) **CUFF** Batch: **B3163.5** CHERRY RIVET 21.0 Comment: Qty.: 44.0000 Each(s)/Unit Total: 44.0000 Each(s) **CHERRY RIVET** Batch: M10407

W/O:		WORK ORDER CHANGES									
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	NCR:	,	W	ORK OR	DER NON-CONFORMANCE (NCR))		
			Description	Description of NC Corrective Action Section B Initial Action Description Sign &		Verification	Ammanual	A
1	DATE	STEP Description of NC Section A		Initial Action Description Sign & Chief Eng Date		Section C	Approval Chief Eng	Approval QC Inspector
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W/O:		WORK ORDER CI	WORK ORDER CHANGES							
DATE	STEP	PROCEDURE CHANGE	Ву	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector			

Part No: D412-664-245 PAR #: NA Fault Category: Poo - Finish NCR Yes No DQA: Date: MOTIF

QA: N/C Closed: 1 Date: 07.07.18

NCR: 3	2441	W	ORK OR	DER NON-CONFORMANCI	E (NCR)	,	<i>,</i>	
	/	Description of NC	Description of NC Corrective Ac			Verification	Approval	Approval
DATE STEP	Section A	Initial Chief Eng	Action Description Chief Eng	Sign & Date	Section C	Chief Eng	QC Inspecto	
A.A.11	24.0	Primar LOVAS visible on the the Ale The Rection; Human erver		Strick And repaint per cessons	ML			
070F(L		R.C. Prontwas missed on a section; Homan error	Posion		07012	DA-13	POSICIZ	AUNI
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'Date: Tuesday, 22/05/2007 10:12:35 AM Linda Lacelle User: **Process Sheet** Drawing Name: X-TUBE 412 Customer: CU-DAR001 Dart Helicopters Services Job Number: 32447 Part Number: D412664245 Job Number: Description: Seq. #: Machine Or Operation: D3595 Rubber Cushion (per sq ft) 0.0536 sf(s)/Unit Total: 0.0536 sf(s) Comment: Qty.: **Rubber Cushion** Cut to .630" X 5.7" X 2PCS Batch: 3289L D28961 28.0 Comment: Qty.: 1.0000 Each(s)/Unit Total: 1.0000 Each(s) Pick: Qty Part number Description Batch Support 36200 1 D2896-1 D2856600 29.0 0.9450 f(s)/Unit Total: 0.9450 f(s) Comment: Qty.: Abrasion Strip 2 X D2856-600-1009 Batch: 266.5 30.0 MS2192028 Comment: Qty.: 4.0000 Each(s)/Unit Total: 4.0000 Each(s) Pick: Qty Part number **Description Batch** Clamp /03 856 4 MS21920-28 07 07 31.0 MS2192030 Comment: Qty.: 2.0000 Each(s)/Unit Total: 2.0000 Each(s) clamp(per MIL-DTL-8783C) 0 > -62 - /9
LANDING GEAR RESOURCE 1 32.0 Comment: LANDING GEAR RESOURCE 1 Assemble as per Dwg D412-664-245 Install Chaffing Sheilds

Dart Ae	rospace	: Lta								
W/O:		WORK ORDER	WORK ORDER CHANGES							
DATE	STEP	PROCEDURE CHANGE	Ву	Dat	e Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector			
Part No	•	PAR #: Fault Category:	NCR: Yes	No	DQA:	_ Date: _				
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NOD.		WORK ORDER NON-COM	VEORMANCE (NC	R)						

NCR: WORK ORDER NON-CONFORMANCE (NCR)								
		Description of NC		Corrective Action Section B		Verification	Approval	Annewal
DATE	STEP	Section A			Section C Chief En		Approval QC Inspector	
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'Date: Tues	sday, 22/05/2007 10:12:35 AM	
	a Lacelle	Process Sheet
Customer:	CU-DAR001 Dart Helicopters Services	Drawing Name: X-TUBE 412
the second second		
Job Number:	32447.	Part Number: D412664245
Job Number:		
Seq. #:	Machine Or Operation:	Description :
	Instal support with magnobond 6398 per d	wg D412-664-245,
	cure for 12hrs before packaging.	\$ 2T
	Time & date of application:	3 07-07-14
	Batch: 104723	
33.0	QC5	INSPECT WORK TO CURRENT STEP
Comma	INCREAT WORK TO CURRENT STER	ST 5716 (1)
34.0	PACKAGING 1	PACKAGING RESOURCE #1
U 1.0	FINALITY IN THE MENTER OF THE	
11 19 100 1		
Comme	ent: PACKAGING RESOURCE #1	
	Identify and pack for shipping as per PPP I	D412-664-205
	******Ensure tube is not packaged if curing	time is less than 12 hrs, see step 27 for application time & date
	******	4
	Time & date of packaging: 11/5	7/1/1
	Time & date of packaging: / -/ 3	
	Location:	<i>1</i> .,
	PPP Rev: 17/1 32188	
35.0	QC21	FINAL INSPECTION/W/O RELEASE
Comme	nt: FINAL INSPECTION/W/O RELEASE	11111111111111111111111111111111111111
- VVIIIIIV	THAL INSPECTION WORLLAGE	R VOTION (CC)
Job Completion		U 07-07-16
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W/O:		WORK ORDER CHA	WORK ORDER CHANGES									
DATE	STEP	PROCEDURE CHANGE	Ву	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector					
Part No		PAR #: Fault Category:	NCR: Yes	No DO	Δ.	Date:						

QA: N/C Closed: ____ Date: ____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)									
DATE STEP		Description of NC		Corrective Action Section B		Verification					
		Section A	InitialAction DescriptionSign &Chief EngChief EngDate		Section C	Approval Chief Eng	Approval QC Inspector				
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DESIG	P	DRAWN BY	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA
CHECK	ED ,	APPROVED ,//	DRAWING NO. REV. C
		1 At	D412-664-245 SHEET 1 OF 3
DATE		******	TITLE SCALE
07.0	3.29		CROSSTUBE ASS'Y (412 LOW-N AFT) NTS
Α		06.12.01	NEW ISSUE
В		07.03.01	CHG CUFF AREA, CHG RUBBER CUSHION
С		07.03.29	CHG RIVET AND RUBBER CUSHION

RELEASED 070424

PARTS LIST:

Qty	Part Number	Description
Х	D412-664-245	CROSSTUBE ASSEMBLY (412 LOW-NARROW AFT)
1	D6009-129	CROSSTUBE
2	D2856-600-1009	ABRASION STRIP
1	D2896-1	SUPPORT
2	D3189-1	CHAFING SHIELD
2	D3595-063-570	RUBBER CUSHION
2	D3606-1	CUFF
44	CR3212-4-07	RIVET (OR M7885/3-4-07)
4	MS21920-28	CLAMP
2	MS21920-30	CLAMP (OR MS21920-32)
A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)
A/R	SIKAFLEX-241/-291	SEALANT (OR PROSEAL 890 OR MIL-S-8802 CLASS B2 SEALANT)

GENERAL NOTES:

TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.

MATERIAL: MANUFACTURED FROM D6009-129

FINISHED LENGTH = 123.59±0.020 (BEFORE BENDING/TRIMMING)

FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1 3) PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2 PAINT OUTSIDE PER DART 005 4.2

PART IS SYMMETRIC ABOUT CENTERLINE.

RUN-OFF PART. BLEND OUT EDGE LONGITUDINALY, TRANSITION SHOULD BE SMOOTH. 5)

BEND PROGRESSIVELY WITH A MINIMUM OF 8 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D., EXCEPT UP TO 10% IS ALLOWED IN AREA NOTED. LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038. 6)

SCRIBE DART PART NUMBER AND BATCH NUMBER IN THIS AREA WITH VIBRATING STYLUS. 8)

INSTALL D2856-600-1009 ABRASION STRIP WITH A 0.13 (REF) GAP ON BOTTOM SIDE OF CROSSTUBE PER QSI 035.

10) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE

11) APPLY A 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2896-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING

12) INSTALL MS21920-30 CLAMPS (OR -32) WITH D3595-063-570 RUBBER CUSHIONS TO SECURE D2896-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE CROSSTUBE SUPPORT.

13) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

14) INSTALL D3606-1 CUFF AFTER CHEMICAL CONVERSION COAT BUT BEFORE PAINT, WITH A LAYER OF SIKAFLEX-241/-291 OR PROSEAL 890 OR MIL-S-8802 CLASS B2 SEALANT BETWEEN CUFF AND CROSSTUBE. SEAL EDGE OF CUFF TO ENSURE NO GAPS.

15) TOUCH-UP HOLES WITH CHEMICAL CONVERSION COAT.

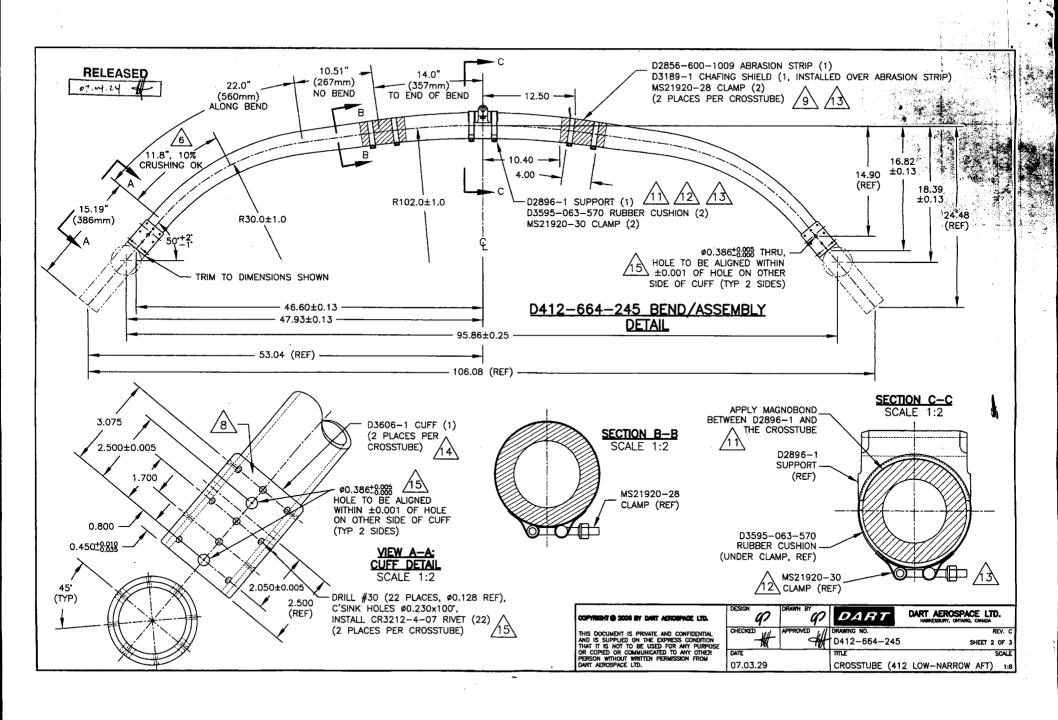
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W/O:		WORK ORDER CHANGES										
DATE	STEP	PROCEDURE CHANGE	Ву	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector					
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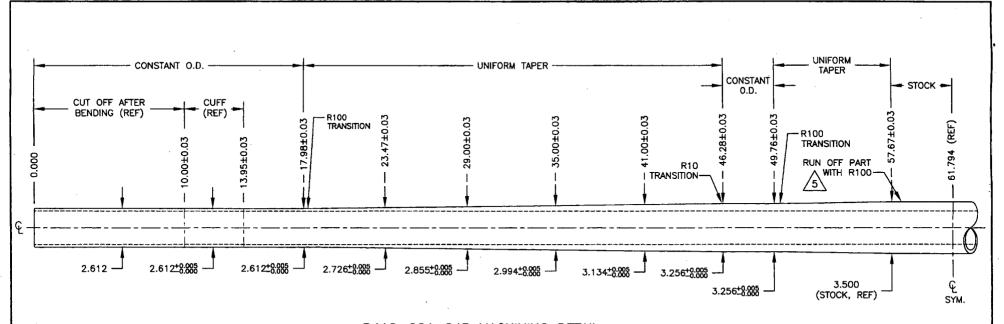
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NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
		Description of NC		Corrective Action Section B		Verification	Approval	Annroyal
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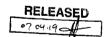


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DATE STEP		Description of NC		Corrective Action Section B		Verification					
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D412-664-245 MACHINING DETAIL



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THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE	CHECKED	APPROVED	D412-664-245	REV. C SHEET 3 OF 3
OR COPIED OR COMMUNICATED TO ANY OTHER	DATE		TITLE	SCALE
PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	07.03.29		CROSSTUBE (41	2 LOW-NARROW AFT) 1:4

DART AEROSPACE LTD	Work Order: 1337447
	2.11.1.2////2///
Description: メルピト 412	Part Number: 19126(4) 145
Inspection Dwg リタインチャング Rev: と	Page 1 of 1

FIRST ARTICLE INSPECTION CHECKLIST

X First Article	Prototype
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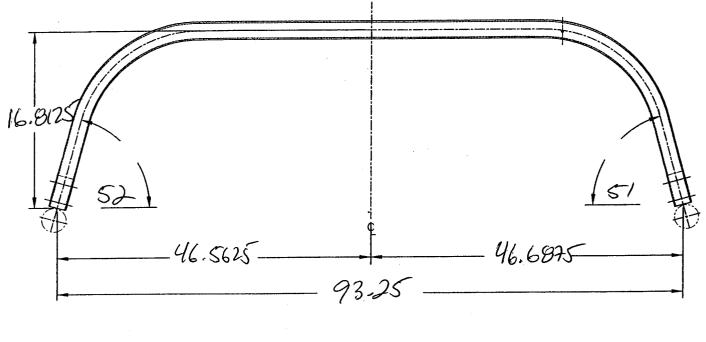
Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
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2.612	, e	2.615				
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Measured by:	Audited by:	me	Prototype Approval:	
Date: 07/05/21	Date:	07/05/28	Date:	

Rev	Date	Change	Revised by	Approved
Α		New Issue	KJ/JLM	

DART AEROSPACE LTD	Work Order:	32447
Description: Crosstube Low Narrow Aft (412)	Part Number:	D412-664-205
Inspection Dwg: D412-664-245 Rev: C		Page 1 of 1

Required Dimension	Min	Max
Height	16.69	16.95
1/2 Span	46.47	46.73
Angle	49°	52°
Total Span	92.94	93.46



Co	mments
-	
QC15 Inspection Date	
	0006:04

Rev	Date	Change	Revised by	Approved
Α	07.04.27	New Issue	KJ/JM	



CUSTOMER:

ADDRESS:

W.O. $M_{\bar{0}}$ 36580

P.O. NUMBER

CONTACT NAME:

Linda Lacelle

A.M.O. Number: 46/90

NON-DESTRUCTIVE TESTING REPORT

REGISTRATION:	MODEL/TYPE:			
neutomation.		`	SERIAL NUMBER:	
TOTAL HR/LDG:	OPERATED BY:		BASED AT:	
Carry out FPI of (7) cross Section 4.1.1 (on file at Qty (1) P/N D212-664 Qty (2) P/N D212-664 Qty (3) P/N D412-664	ss tubes (external such client) - parts deliver 101 S/N B3135 1-203 S/N B3018 1-201 S/N's B3042	ered to HeathAir. 66.	M E-1417-05 and the	ne Dart QSI 038,
RADIOGRAPHY	ULTRASONIC.	PENETRANT	MAGNETIC PARTICLE	EDDY CURRENT
	nspection was perfo	l for the requested	e with the above rel Level 2 (3 is more	
	SCRIBED ABOVE HAS BEEN PERI PPLICABLE STANDARDS OF AIR		DATE INSPECT	June 06, 2007
INSPECTED BY:)MER:INEORMA	STAMP(S	PO 00003908)

\$ @ LA30UR @ MATERIALS GST TRAVEL EXPENSES @ @ PST HCTEL EXPENSES TOTAL \$ INVOICE NO.

DART AEROSPAC	ELTD	Q		V	Vork Order:	32447		
. Deści ption: Bearpay	· Cuff Sig/C	F412 AFT	MB9	2	Part Number:	D412-661-24		
inspection Dwg: Y/Q		<u> </u>		+		Page 1 of 1		
	, -	RTICLE INSF	ECTION	CHECK	CLIST			
X First Article Prototype								
Inspection Sheet Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments		
A0.450	1-0.010	0.460						
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Ray Dafe Char					Revise KJ/RF	d by Approved		